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Selecting Sheep for Wool and Mutton Production

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Selecting Sheep for Wool and Mutton Production

by

James A. Gray and Jack L. Groff*

Increasing production costs and little or no increase in income make it necessary to get as much production per ewe as possible. A good wool and lamb production in each animal in the flock is necessary. As much grass is needed to support a low producing ewe as a high producing one.

High lamb prices sometimes make producers sell their best replacement prospects and keep poorer quality animals for replacement. The largest, growthiest ewe lambs make the best replacements. If they are sold for several years, the quality of the ewe flock deteriorates rapidly. A producer cannot sacrifice quality in replacement breeding ewes and maintain a high production level in the flock.

Every producer should have a long-range program. If he is producing replacement breeding animals, he should follow a planned breeding program. If he is buying replacement ewes, he should have a regular source and replace a certain number of animals each year. Selective breeding programs, ideas and goals should be well planned.

Making Selection Work

Increased flock production is greatest in flocks with a wide range of productivity in the animals. Progress is slower in flocks with good uniformity.

Requirements for Success

- There should be enough animals in the production program each year to enable the producer to sell the inferior animals. This should be done faithfully.
- Selective breeding should be practiced for at least 5 or 6 years for permanent benefits.

*Extension sheep and goat specialists, San Angelo and Kerrville, respectively.

- The person selecting should have a goal in mind and select toward it. He should not allow minor things, such as appearance of the ears, color of the eyelashes, beautiful crimp and color of the hooves, greatly influence his selection.
- Rams, to improve the ewe flock, should be carefully selected by the producer. Ram selection should not be left to the purebred breeder. The purebred breeder may select rams to the best of his ability and with good intentions. Unless he is familiar with the flock in which the rams are to be used, he may select the wrong type. Unless rams are selected as carefully as the ewes, little benefit will result from selective breeding. When possible, superior, production-tested rams should be used. By using tested rams the producer can be sure of their ability to gain, the pounds of grease and clean wool and the staple length they produce. This removes much guesswork in selecting rams.
- Personnel trained in selection should be asked to assist the producer.

Obstacles

- It is difficult to round up all sheep from pastures. Some sheep will be missed, some of which will be inferior.
- Few people are trained and qualified to make proper selection. These people should have the confidence of the producer.
- A poor job on a first selection attempt may discourage the grower. Trained personnel can help with the selection program.
- Some producers think all of their sheep will be culled. A plan can be adopted where numbers will not have to be reduced nor the

overall operation of the ranch curbed.

- The belief that good wool and good lamb production cannot be maintained in the same flock often prevents owners from starting a selection program. Selections can include both types of production.
- A breeding program that does not provide enough ewe lambs for replacement purposes makes rapid progress impossible.

What Selection Cannot Do

- A selection program cannot overcome the effect of poor rams.
- It cannot improve the flock if the culls are not sold or managed according to plan.
- It cannot overcome the effect of poor financing or poor management.
- It will not turn a low producing flock into a high producing one in 1 or 2 years. Permanent changes depend upon heredity and take time to establish.
- It cannot overcome the effect of poor nutrition or physical condition caused by disease, parasitism or overgrazing.



Excellent equipment for a selection program: a working chute with a cutting gate at one end and a pen to the right of the working chute where a few questionable animals may be placed.

Programs

Consider the number of animals and pastures plan a selection program to make best use of pastures and fit the normal operation of the ranch.

Every flock has a population distribution includes some high producing individuals, a large number of average producers and some low producing individuals, figure 1. The greater the variation in a flock, the more elongated the profile; the more uniform the flock, the flatter the profile.

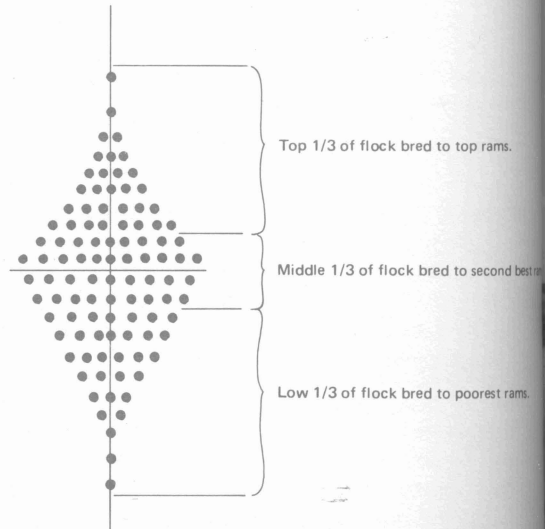
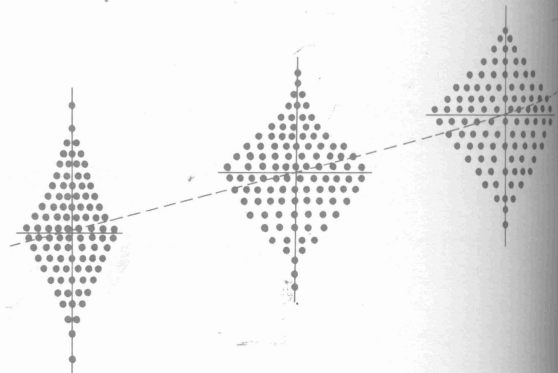


Fig. 1. This figure represents the profile or population distribution of a flock of sheep. The distribution shows 50 percent of the flock above average production and 50 percent below average with a few high and low producers.

A selective breeding program should identify the high, medium and low producing individuals and market them for the greatest use of superior rams and ewes. The selective breeding program will flatten out the profile and move the average production up, figure 2.

Fig. 2. A selective breeding program should flatten out the profile and move the average production up. The flattening of the profile is caused by greater uniformity in the flock with fewer extremes of high and low production.



Improvement is greatest in a selective breeding program when a certain percentage of the poorest individuals is sold. The culled animals should be replaced with carefully selected yearling ewes. Some producers cannot do this, especially when trying to increase flock numbers.

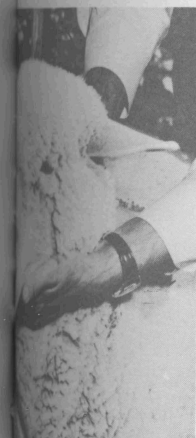
The most popular selective breeding program is to divide the flock into two or more groups according to their ability to produce lamb and wool. Big, open-faced ewes with good conformation, good staple length and uniform fleeces make up the first group. The second group includes smaller ewes with more wool in the faces and poorer fleeces. The third group consists of the smaller, more wool blind and poorer fleeced ewes. Each group should be identified with colored ear tags or special ear marks so it can be easily separated.

Rams should be separated into similar groups. Mate the best ewes to the best rams, the second best ewes to the second best rams and the third group of

ewes to the poorest rams or to mutton type rams for a crossbred lamb. This system of mating the best rams with the best ewes possibly can produce still higher producing animals. Replacement ewes only should be saved from the top two groups of ewes. Ewes coming from any other group should be sold as market lambs.

Flock stratification may be done by the use of production records, grease fleece weights or visual appraisal. Production records are the most accurate since they consider reproduction and body and fleece weights. Fleece weights, staple lengths and quality would be a secondary method, since they give some accurate measurements of wool production. Visual selection is the third choice in stratification of the flock but is still very useful.

If a producer thinks the quality of the ewe lambs will improve his flock, a larger number of replacements can be kept and more of the poorer quality ewes culled.



Too Face
The wool on the face is too short even with the staple length does not taper and the poll too much.

Too Much
When too much wool is taken off the face, it usually is accompanied by shorter wool elsewhere on the body.

Wool Blind
This ewe is so woolly faced that she will become wool blind before shearing time.

In-between Kind
This ewe probably will not become wool blind, but has more wool in the face than desirable.

Photos courtesy of San Angelo Standard Times.

Equipment

Little equipment is needed for a selection program. Corrals are necessary for confining and crowding the sheep. A selection chute with panels is needed. This chute should be 4 feet wide and as long as desired. It should be arranged so the sheep are paneled off in small groups and will not pile up and suffocate.

A permanent selection chute with a narrow chute and cutting gate at one end facilitates animal separation after selections have been made. By separating the animals immediately, the groups can be compared and changes can be made.

When to Select

The fleece is the most accurate record that can be kept. It tells the wool-producing ability of the sheep and how well the animal has done through the year. It is used as the basis for making selections on wool production.

Selections should not be made until 4 months or more after shearing. The ewes have equal time to grow wool and differences in wool production are easy to detect. Because of possible age differences, ewe lambs and yearling ewes are more difficult to judge. They may vary as much as 2 months in age, causing as much as 1/2-inch difference in staple length.

Some producers select in the fall after the ewes have been shorn in the spring; others make selections in the spring when sheep have a 12 months' growth of wool. Results are good at either time.

Many ranchmen select at shearing, lamb delivery time or when the sheep are gathered for drenching. Working the sheep at these times does not require additional gathering and handling of the animals. Selection at lamb delivery time is the most popular.

Points to Consider in Selection

Wool and mutton production must be considered if the maximum income per animal is to be realized. Large, smooth, open-faced, finewool sheep are the most profitable for Texas range sheep production. In this type of production, about two-thirds of the income is derived from lamb sales. With practice, a producer should become proficient in sheep selection. Refer to the table on page 11.

Mutton Producing Qualities

Large, smooth ewes with good mutton conformation produce the most popular lambs with buyers.

Open-faced ewes are likely to have lambs with open faces; ewes with covered faces will likely have lambs with covered faces. Periodic shearing around the eyes, which means additional expenses to the producer, does not increase production of ewes with covered faces.

Records at the Ranch Experiment Station near Sonora from 1935 to 1950 show that ewes with covered faces, capable of becoming wool blind, produced 5 to 9 pounds less weaned lamb per ewe than ewes with partially covered faces. Most of this difference was due to the difference in percentage of lambs weaned.

Completely open-faced ewes produced fewer lambs than those with a small amount of wool in the faces, indicating that it is possible to reduce production by getting sheep too open faced or too covered.

Because of the large amount of needlegrass and Texas wintergrass (spargrass) in much of Texas, the

open-faced characteristic has additional economic value. Ewes and lambs with open faces do not suffer the damage caused by spears and needles that occurs in wooly-faced sheep. It is necessary to shear around the eyes of wooly-faced sheep, which means additional expense to the producer and no increase in production.

Select ewes with wide, deep bodies, full heart girths, wide loins and muscular legs. This type of ewe should have adequate size and a good constitution.

Wool Producing Qualities

Points to consider in selecting for fleece fall under two categories—quantity and quality.

Quantity

Quantity depends on length, density, completeness of covering and size of the sheep.

LENGTH. Staple length probably is the most important factor affecting the amount of wool that one sheep can produce. Average fleece weights were obtained on approximately 20,000 graded fleeces from 17 different ranches in the Sonora area. Fine staple fleeces, 2½ to 3½ inches in length, had an average grease fleece weight of 8.2 pounds; fine french combing, 2 to 2½ inches in length, 7.2 pounds; and fine clothing, 1½ to 2 inches in length, 6.3 pounds. This shows that with each increase of approximately 1 inch in staple length, it is reasonable to expect about 1 pound increase in grease fleece weight. Similar increases occur in the clean fleece weights.

Long staple finewool usually sells for 10 cents more per pound than short staple finewool. Longer staple wools have a higher yield than the shorter staple wools making the proportionate grease price even greater for the longer staple wools.

DENSITY. Density is the number of fibers per unit of area. This is more difficult to measure than staple length. The following methods can be used to estimate density:

- Open the fleece and note the amount of skin area exposed. The more skin area exposed, the less density.
- Note the resistance of the fleece to opening. This method is useful in judging comparatively fine fleeces of average length.



Cull and keep. Left, the culled ewe is shallow-bodied, has several skin folds, short-staple fleece and wool must be clipped from her face to prevent wool blindness. Right, the retained ewe has an open face, wide deep body, smooth skin and ½ inch more staple length of wool.

Photo courtesy of San Angelo Standard Times.

- Grasp a handful of the fleece and squeeze and note whether there is a large or small amount of wool in your grasp.

These methods give a satisfactory field estimate of density. There are several ways to measure density accurately but they are too technical and slow for a rapid selection method.

The following conditions may cause misjudgement of density when one of the rapid selection methods is used:

- Differences in length. Short wool always appears more dense than long wool of a similar density.
- Excessive yolk may add to the bulk of the fleece and cause an over-estimation of density.
- The open tips of yearling fleeces make them appear less dense than fleeces on sheep previously shorn.
- A harsh, wiry fleece appears to be more dense than a softer fleece.

COMPLETENESS OF COVERING. Sheep should have a uniform covering of wool over the entire body, except on the face and legs, below the knees and hocks, where it is of little value and adds little to the weight of the fleece. Range sheep should have a good covering of wool on the head down to the eyes and on the upper portion of the legs.

Many breeders neglect the covering of wool on the belly. Some have allowed the extremely crimped, belly-type wool to grow on the sides of the animal, cutting down on the average shearing weight of the flock. In practical selection, it is a waste of time to look for good wool on the sheep's belly if it does not have a good fleece on its back. Rams should be carefully selected for completeness of covering, except on the face.

SIZE OF THE ANIMAL. The practical sheepman prefers a big sheep which normally produces more wool than a small one. The relative efficiency of wool production has not been determined completely. The most efficient wool producer *possibly* is a medium-sized sheep.

Quality

Quality is determined by fineness, length, soundness and purity.

FINENESS. Texas has a reputation for fine wool of excellent quality. Wool market statistics show that over a long period, fine wool outsells coarser grades because it takes fine wool to make a soft worsted fabric.

Uniformity of fineness is important. Individuals with a coarse, hairy britch should not be used as breeding animals. Uniformity between individuals in the

flock also is important. Select one grade for fineness and length to insure a uniform clip of wool.

Coarse, hairy britch should be eliminated from the flock through selection. Hairiness increases the amount of waste fibers during manufacture. Coarse britches can be detected most easily in the fall after the sheep have been shorn in the spring.

LENGTH. Staple length helps determine grade. The longer the wool of a certain fineness, the higher the grade, but it is possible to obtain length in excess of grade requirements. Extra length means pounds. A 3-inch staple makes the best finewool. A rule of thumb that may be used for staple length in finewool sheep is 1/4 inch growth per month. This produces a 3-inch staple in 12 months. It is easy to project 12 months staple length after the sheep have been shorn 3 or 4 months.

SOUNDNESS. When a sheep has fever, a weak spot appears in the fleece. When severe, the sheep sheds its fleece. Sheep that shed, "brush off" or pull their wool out on the brush should be eliminated.

PURITY. Purity of fleece is important in selecting quality. Animals with black or brown faces or spots in the fleeces should be eliminated. Wool containing dark colored fibers cannot be used to make white or light colored fabrics.

Sheep with kemp, white, hairlike fibers scattered through their fleeces should be eliminated. Kemp fibers are brittle and increase breakage during manufacture. They reflect light differently than wool fibers and the fabric does not dye uniformly.

Ram Selection

A flock cannot improve unless the rams are superior to the ewes. As a flock produces more, it becomes more difficult to find rams that will improve the flock.

As a result, many ram breeders are production-testing rams. These tests have been conducted at the Ranch Experiment Station near Sonora, Texas for the past 23 years.

In mid-September, ram lambs are brought to the station where they are sheared, scored and given a 10- to 14-day conditioning period. They are fed in sire groups of four rams in each pen for 168 days. In this way, records of feed consumed and the amount of feed required per pound of gain are accurate. Other records include average daily gain, grease fleece weight, clean fleece weight, staple length and fiber diameter. Conformation, belly wool, skin folds and face covering are recorded by a scoring committee. Measurements of grease fleece weight, clean fleece weight, staple length and fiber diameter are actual measurements for a known period of growth and converted to a 12-month basis.

Other rams are fed in large groups, keeping the same type of records.

As shown in Table 1, improvement has been made in average daily gain and grease and clean fleece weights.

The greatest improvement has been made in staple length which is probably one of the most highly heritable characteristics of sheep. Practically no change has occurred in the face covering of the rams on test and only slight improvement in the number of skin folds.

Table 1. AVERAGE VALUES FOR RAMBOUILLET RAMS ON THE 23-YEAR TEST

	Daily gain lb.	Grease wool lb.	Clean wool lb.	Staple length in.	Face covering score	Skin fold count
1948-49	.37	13.8	6.6	3.36	2.7	33
1949-50	.45	16.7	7.8	3.57	2.8	38
1950-51	.49	18.0	8.1	3.34	2.7	44
1951-52	.46	17.7	8.2	3.47	3.3	25
1952-53	.48	18.4	8.6	3.56	3.0	40
1953-54	.51	19.5	9.3	3.80	2.9	31
1954-55	.49	17.8	8.7	4.07	2.8	32
1955-56	.48	19.9	9.2	3.87	2.7	26
1956-57	.50	18.8	9.1	4.02	2.8	25
1957-58	.60	19.2	9.3	4.20	2.6	36
1958-59	.49	15.4	8.0	4.16	3.0	26
1959-60	.51	16.0	9.2	4.41	3.0	23
1960-61	.50	17.1	9.0	4.21	2.8	23
1961-62	.53	18.4	9.5	4.21	2.8	29
1962-63	.55	17.4	9.0	4.12	2.6	18
1963-64	.56	18.3	9.4	4.56	2.7	20
1964-65	.51	18.1	8.9	4.53	2.7	20
1965-66	.51	19.8	9.9	4.33	2.3	20
1966-67	.51	18.4	9.3	4.35	2.2	20
1967-68	.52	17.9	9.1	4.53	2.1	20
1968-69	.54	17.0	8.9	4.53	2.3	18
1969-70	.66	19.6	9.8	4.41	2.0	17
1970-71	.67	20.7	10.3	4.73	2.1	19

*Method of scoring skin folds changed from counting to scoring system.

Several of the larger commercial ranchmen raise their own rams and have developed a system of range production testing that is practical for their own situations.

Ram lambs are weaned when the largest percentage weigh about 75 pounds. Then they are identified, weighed and run together under pasture conditions until September when they are weighed and sheared. They are

then run under pasture conditions until the following spring when they are weighed and sheared once more. At this time fleece weights and staple lengths are taken. This gives the ranchman three body weights to use and the fleece weight and staple length for a known period of growth. From this information the ranchman can pick his fastest-gaining, best wool-producing rams. Most ranchmen test about twice as many rams as they intend

to keep and dispose of the ones they do not want.

Develop a reputation flock of sheep by:

1. Balancing livestock numbers with land, facilities, available feed and labor.
2. Following carefully planned grazing and range improvement programs.
3. Practicing selective breeding for greater production and increased quality.
4. Following sound flock management practices.
5. Making best use of supplemental feeds.
6. Controlling internal parasites through controlled and rotation grazing, proper stocking rates, supplemental feeding and systematic treatment.
7. Practicing proper preparation of wool for market.
8. Marketing on a quality basis.

Results of Selection

Seventy-five ranchmen with sheep producing wool of similar quality were used to determine the value of selection. Twenty-eight ranchmen practiced selection while 47 did not. Those who practiced selection received 7.7 percent more for their wool than those who did not.

A selective breeding program provides several benefits. The sheep become more uniform in appearance and in wool production. This reduces the number of "cuts" when the lambs are delivered and the number of "off type" fleeces in the wool clip.

One benefit of selective breeding is the increased percentage of lamb crop. A selective breeding program used on a flock of Columbia ewes produced the following results in 4 years:

Year	Percent lamb crop
First year	102
Second year	106
Third year	112
Fourth year	130

Although the fourth year was dry, the lamb crop produced 113 sets of twins, 14 sets of triplets and 117 single lambs.

In addition, the animals become better suited to the range conditions under which they are being produced. Greater adaptability lets them produce more under the existing range conditions.

One cooperator who has practiced selective breeding for 12 years reports the following:

	Start of program	8 years later	12 years later
Lambing percent	80%	120%	125%
Lamb weight	60 lb.	72 lb.	78 lb.
Fleece weight	8 lb.	12 lb.	13 lb.
Staple length	2-2½ in.	3¼-4 in.	3¼-4 in.
Wool shrinkage	70-72%	57%	54-56%
Income per ewe	\$13.80	\$25.80*	\$28.93*

*Income per ewe does not include incentive payment. Prices of 25 cents per pound for lamb and 35 cents per pound for wool were used to figure the income per ewe; however, this is not totally accurate because the quality and value of lambs and wool improved. Production was increased with no additional operating expense. The total number of ewes increased over the 12-year period.



Breeding ewes being selected on the basis of characteristics such as conformation, size and wool-producing ability.

Lamb and Wool Production Increased

A flock of ewes in Bandera County was divided into three groups according to their ability to produce lamb and wool. The rams were also separated into three groups and the best ewes were mated to the best rams, the next best ewes to the next rams and the poorest ewes to the poorest rams. They produced lamb and wool in the following amounts:

Groups	First year wool production		Second year wool production ¹		First year		Second year
	4 months fall shearing	8 months spring shearing	12 months	% lamb crop	avg. wt. lambs, lb.	% lamb crop	avg. wt. lambs, lb.
Top	4.49	5.42	8.25	109	66	115	67
Middle	3.95	4.85	8.15	98	61	103	64
Bottom	3.75	4.67	7.13	96	58	112 ²	60

¹ Changed shearing from twice to once a year.

² The bottom group was culled heavily the first year and given the best pastures, accounting for the high percentage lamb crop. These figures indicate that size and quality of lamb is not sacrificed by selecting for increased wool production.

Crossbreeding

The most popular selective breeding program breeds the top part of the flock with finewool rams for replacements and the bottom part with mutton type rams to produce market lambs.

Crossbreeding is mating two or more purebred strains or breeds. It secures greater vigor, faster growth and greater feed efficiency.

Crossbreeding sheep under Texas conditions is complicated by crossing an unadapted breed (mutton breeds or medium wool white-faced breeds) with an adapted breed (the finewool breeds). Since only one breed is adapted to Texas conditions, the full benefits of crossbreeding are not realized.

For greatest benefit, the producer should use the best rams available. Poor quality rams crossed with good

quality finewool ewes do not secure the greater vigor, faster growth and greater feed efficiency expected. Production-tested rams with information on rate of gain and feed efficiency generally give better results than untested rams. There is no excuse for using poor quality rams.

A higher lamb crop usually is secured with crossbreeding, because of the hybrid vigor and better livability with the crossbred lambs.

A breeding program in Val Verde County uses the top part of the finewool flock to produce replacement finewool ewes. The low end of the finewool flock is bred to Suffolk rams to produce market lambs. The producer purchases the best finewool and Suffolk rams available and the Suffolk rams are equal in quality to the Rambouillet rams. Results from this program are listed in Table 1, page 6.

Percentage lamb crop

	1962	1963	1964	1965	1966	1967	1968	1969	1970
Crossbred lambs	93	84	92.6	128	129	118	109	94	99
Finewool lambs	93	84	91.3	120	119	104	95	89	94

In good years, crossbred lambs will average a 10 to 15 percent higher lamb crop. In poor rainfall years, the percentage is much closer and rarely exceeds 5 percent

in favor of the crossbred lambs. Weather conditions during the breeding season greatly affect the lamb crop.

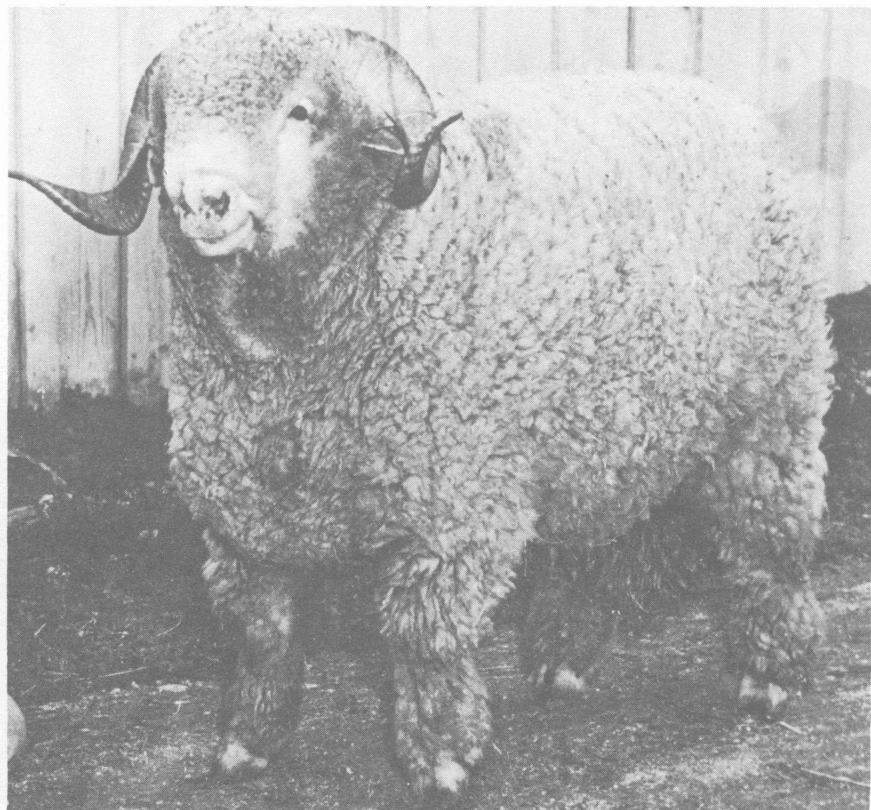
Average lamb weights

	1962	1963	1964	1965	1966	1967	1968	1969	1970
Crossbred-fats	none	73.0	82.0	84.0	86.0	none	85.0	none	88.0
Finewool-fats	none	74.7	72.3	85.0	88.0	none	80.0	none	83.0
Crossbred-feeders	74.0	65.0	none	75.0	75.0	70.0	74.0	77.0	68.0
Finewool-feeders	73.0	none	none	75.0	78.0	71.6	78.0	70.0	73.0

The best ewes in the flock were bred to finewool rams to raise replacements for the flock. Yearling ewes are bred to finewool rams for their first lamb, cutting down on the average weight for finewool lambs. The largest and best ewe lambs are kept for replacement and are not included in the average lamb weights. How much

more would the finewool lambs average if the weights of the replacement ewe lambs were included?

The quality of the top finewool ewes was considerably higher than the low end of the ewe flock. After 5 years of selective breeding, the quality of the flock was improved, along with the weight of the crossbred lambs.



An excellent type of finewool ewe. Note the open face, freedom from wrinkles, good conformation, excellent body depth, straightness of legs and completeness of wool covering.



Excellent head. Note the wide, well placed horns, naturally open face and masculinity.



A good finewool ram. Note the large size, smoothness, well placed straight legs, good body conformation and uniform covering of wool.

CASH RECEIPTS, TEXAS 1940-1970
1,000 DOLLARS

Year	Sheep & Lambs	Total Wool	Percent Income- Sheep & Lambs	Percent Income- Wool ¹
1940	\$13,075	\$23,171	36.1	63.9
1941	13,252	29,598	30.9	69.1
1942	20,630	25,517	44.7	55.3
1943	23,941	41,330	36.7	63.3
1944	24,271	33,368	42.1	57.9
1945	30,190	32,993	47.8	52.2
1946	32,925	30,643	51.8	48.2
1947	34,536	26,637	56.5	43.5
1948	33,212	28,094	54.2	45.8
1949	24,259	25,978	48.3	51.7
1950	29,519	36,248	44.9	55.1
1951	41,148	49,991	45.1	54.9
1952	23,632	26,841	46.8	53.2
1953	19,357	27,400	41.4	58.6
1954	21,243	25,883	45.1	54.9
1955	22,519	27,342	45.2	54.8
1956	23,886	29,048	45.1	54.9
1957	17,028	21,730	43.9	56.1
1958	22,051	22,090	49.9	50.1
1959	21,384	38,577	35.7	64.3
1960	20,834	30,849	40.3	59.7
1961	21,928	34,050	39.2	60.8
1962	22,061	34,055	39.3	60.7
1963	22,925	31,244	42.3	57.7
1964	26,527	26,807	49.7	50.3
1965	22,944	22,798	50.2	49.8
1966	25,761	24,898	50.9	49.1
1967	32,811	25,294	56.5	43.5
1968	34,066	25,389	57.3	42.7
1969	38,526	24,040	61.6	38.4
1970	38,807	22,740	63.1	36.9

¹ 1956 begins government wool incentive payments.

Source: Texas Crop and Livestock Reporting Service

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